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Interferometric position measuring device e.g. for machine tool - uses 2 partial laser beams provided by movable grid supplied to coupler for relative interference

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Patent Family

Patent Number	Kind	Date	Application Number	Kind	Date	Week	Type
EP 254823	A	19880203	EP 87106621	A	19870507	198805	B
DE 3625327	C	19880218	DE 3625327	A	19860726	198807	
EP 254823	B	19900425				199017	
DE 3762455	G	19900531				199023	
US 4938595	A	19900703	US 8777190	A	19870724	199029	
ES 2015555	B	19900901				199039	

Priority Applications (Number Kind Date): DE 3625327 A (19860726)

Cited Patents: A3...8930; DE 3536497; EP 126686; EP 65429; FR 2210762; GB 2043240; US 4445780

Patent Details

Patent	Kind	Language	Page	Main IPC	Filing Notes
EP 254823	A		14		
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DE 3625327	C		5		
EP 254823	B				
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Abstract:

EP 254823 A

The measurer uses a diffraction grid (G) displaced transverse to a beam provided by a semiconductor laser (L), to provide two partial beams (+m,-m) supplied to an optical coupler (TBJ) via respective coupling grids (+HG,-HG) for interference with one another. The interfering partial beams are fed from the output of the optical coupler (TBJ) to respective detectors (-D, D,+D) via optical conductors (+LWL, LWL, - LWL). The detectors (-D,D,+D) provide phase shifted electrical signals evaluated to detect the position of the grid (G) and hence the position of the component to which it is attached.

Pref. three detectors (-D,D,+D) provide signals which are phase-shifted from one another by 120 deg. respectively representing a reference signal and a sine and cosine function fed to an electronic

evaluation circuit.

USE/ADVANTAGE - For accurate relative position measurement in machine tool, widely immune from external variables.

EP 254823 B

The measurer uses a diffraction grid (G) displaced transverse to a beam provided by a semiconductor laser (L), to provide two partial beams (+m, -m) supplied to an optical coupler (TBJ) via respective coupling grids (+HG, -HG) for interference with one another. The interfering partial beams are fed from the output of the optical coupler (TBJ) to respective detectors (-D, D, +D) via optical conductors (+LWL, LWL, -LWL). The detectors (-D, D, +D) provide phase shifted electrical signals evaluated to detect the position of the grid (G) and hence the position of the component to which it is attached.

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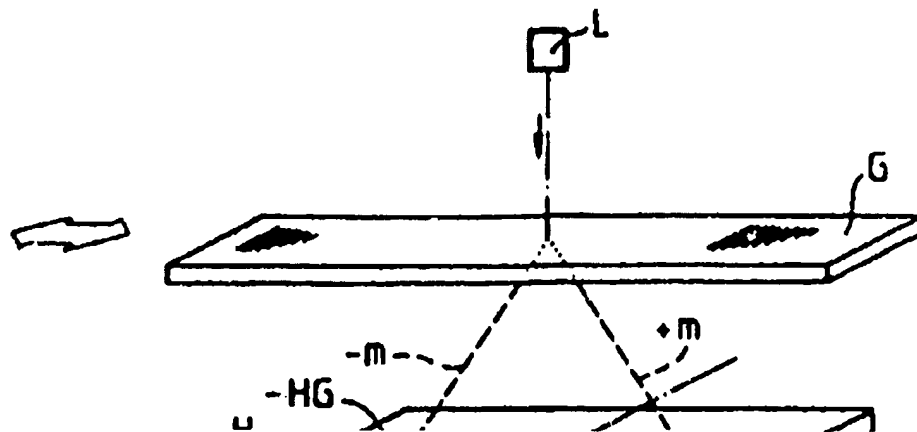
Dwg. 1/4

US 4938595 A

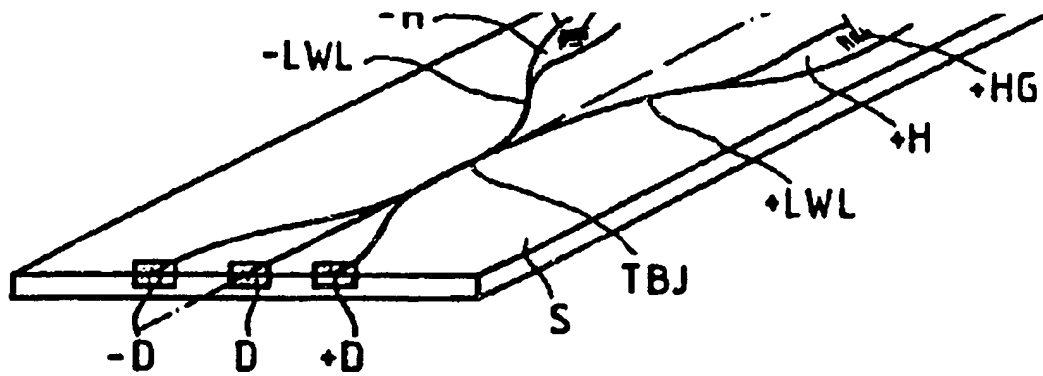
The interferometric displacement measuring device uses the reference norm, in form of a diffraction grid (G).

Diffacted partial beam bundles (+m, -m) are fed into a coupler (TBJ) by coupling grids (+HG, -HG) via beam waveguides (+LWL, -LWL) and there brought into interference. The interfering partial beam bundles are transmitted from the outputs (+A, -A) via beam waveguides (+LWL, LWL, -LWL) to detectors (+D, D, -D) which convert them into electric signals out-of-phase with each other. The displacement of the diffraction grid (G) is a standard for measuring the changes in position of machine components which are movable relative to one another. ADVANTAGE - Excludes disturbances caused by ambient influences thus assuring reliable mode of operation.

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